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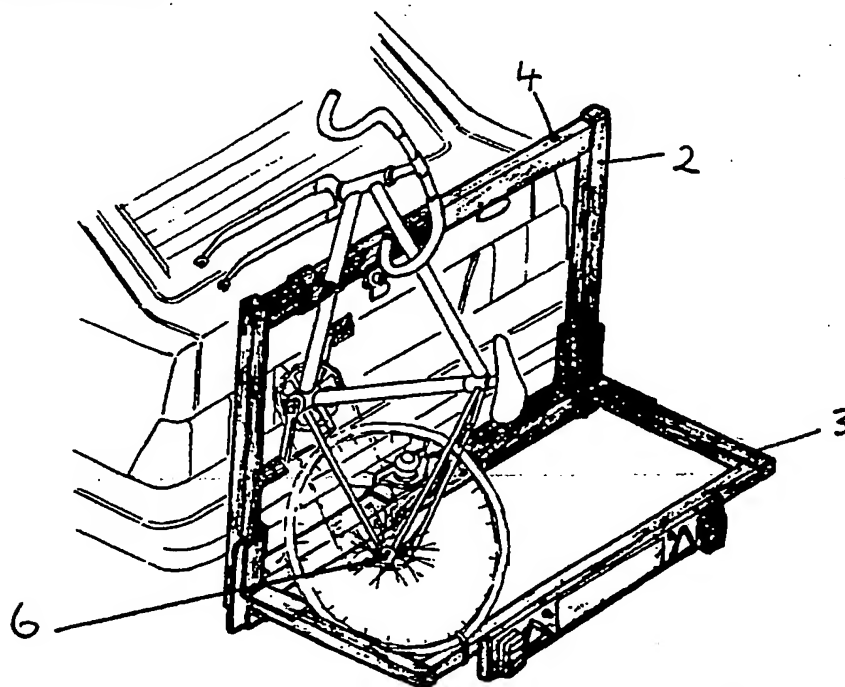
(56) Documents Cited
GB 2225299 A US 5065921 A US 4790713 A
US 4171077 A US 3921869 A

(58) Field of Search
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INT CL⁵ B60R 9/10, B62D 63/06

(54) Bicycle transportation carrier

(57) A bicycle transportation carrier which supports bicycles on their rear wheels with the front forks vertically above. The bicycles front wheels have been removed to allow the handle-bars to be rotated through 90 degrees to permit a denser loading configuration.

The bicycle carrier has a quick release facility to attach it to a vehicle tow-bar. The carrier's lower framework 3 which supports the rear bicycle wheel is hinged to allow it to be folded onto the carrier's vertical framework 2 for compact storage.

**FIG 3.**

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

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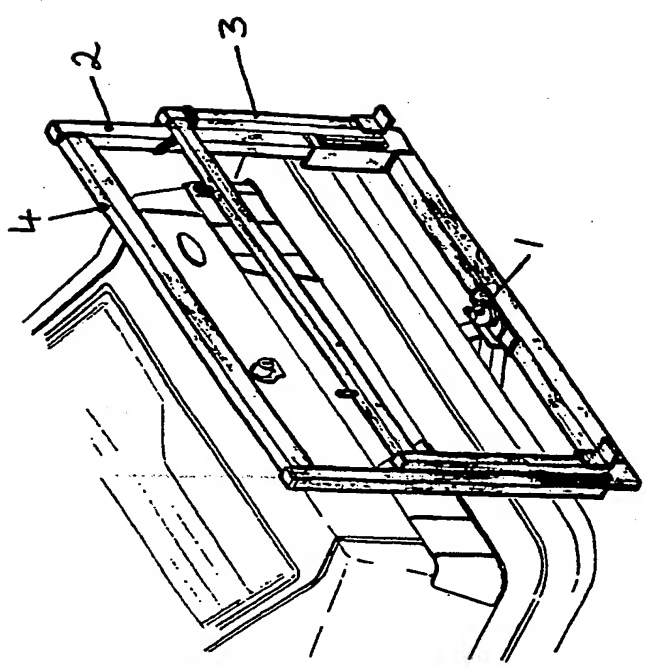


FIG 1.

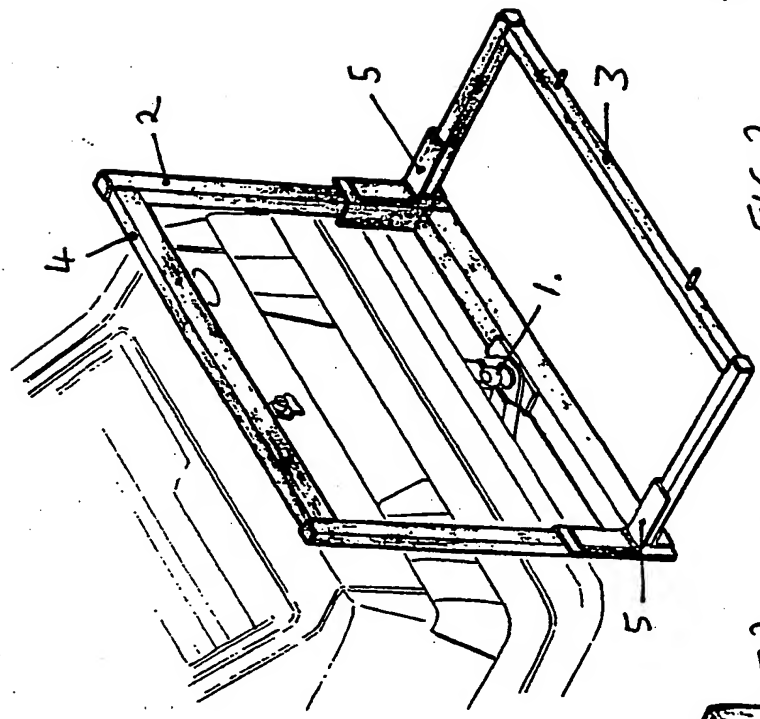


FIG 2.

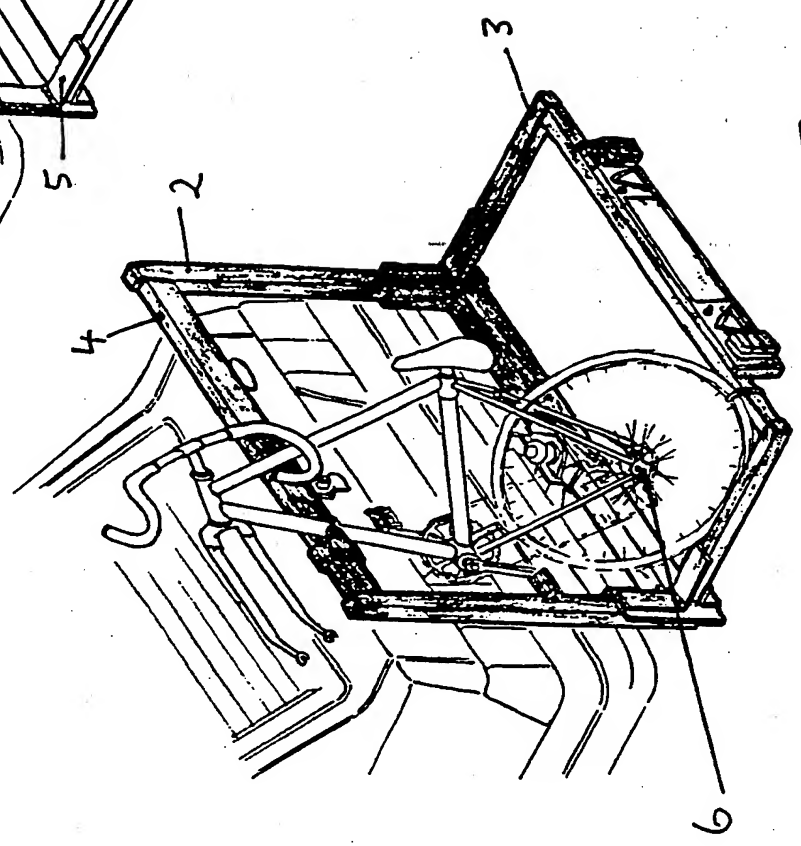
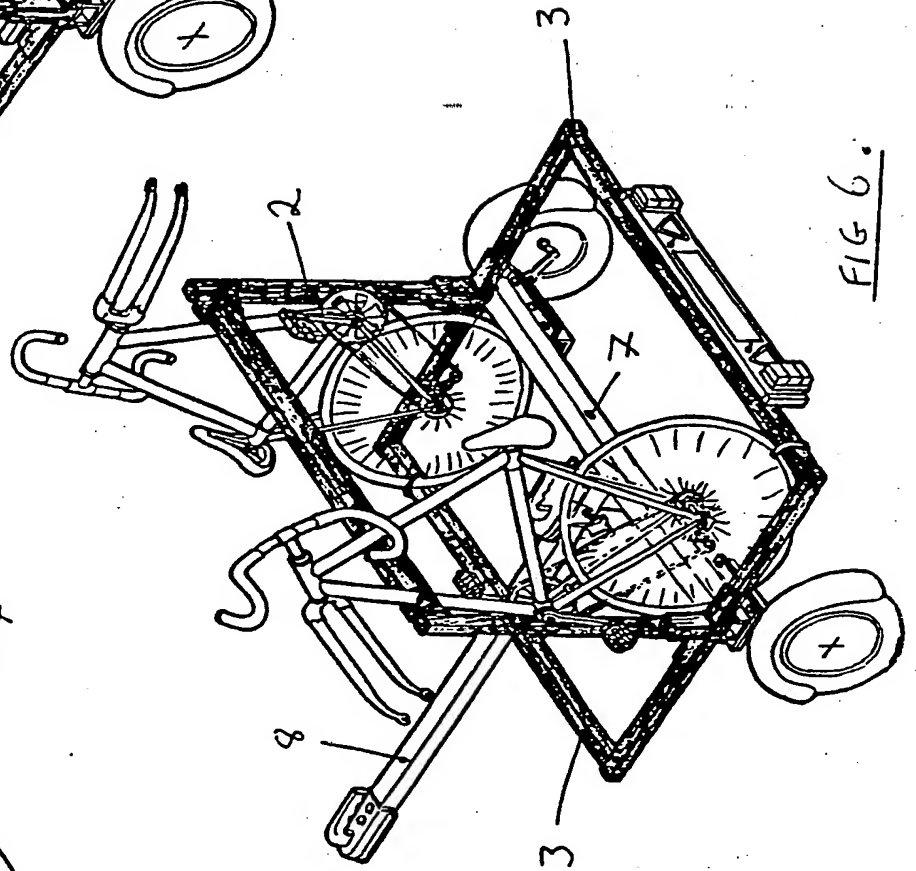
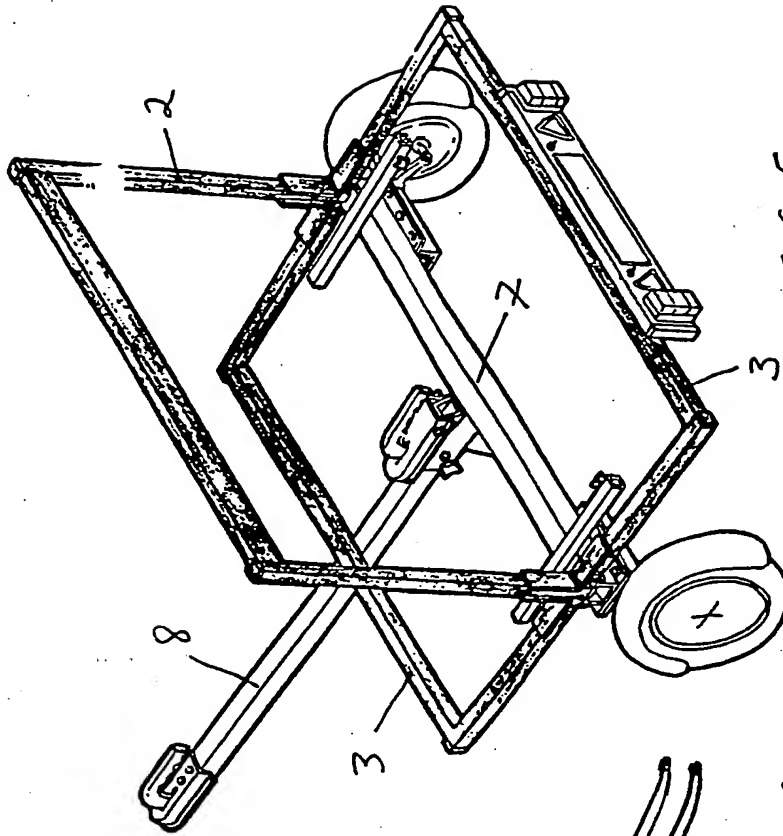
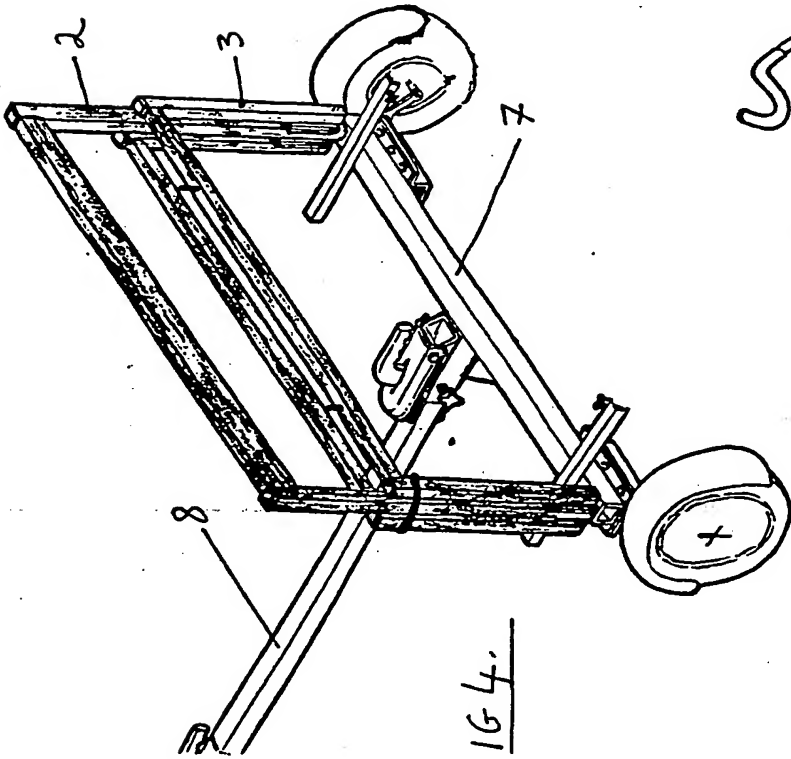


FIG 3.



BICYCLE TRANSPORTATION CARRIER

This invention relates to a carrier which can be attached to a wheeled vehicle for the purpose of transporting bicycles.

There are many types of cycle carrier which attach to vehicles and broadly divide into two categories. The roof mounted variety have problems when bicycles are lifted up to them, risking damage to the car or bicycles. The second variety are vehicle rear mounted, and are either "strap" mounted to vehicle or attached via the vehicle "tow-hitch". In both cases the bicycles are carried transversely across the rear of the vehicle. The disadvantage of transverse carriage is the loading configuration, in which the more cycles that are added the larger the rear overhang.

This results in large bending moments at the bicycle carrier which in turn is transmitted into the tow-hitch or vehicle body panels. In practise the number of bicycles carried transversely is normally two and occassionally three. Four bicycles can be carried on more robust vehicle's tow hitches, but are generally far from satisfactory for the average family car.

This invention tackles the above problem by not transversely mounting bicycles at the rear of vehicles. The configuration chosen is vertically mounting the bicycles with their front wheels removed, at the rear of vehicles. This configuration keeps the centre of moment close to the vehicle, and enables more bicycles to be individually supported on the rear of a family vehicle. The carrier also enables adjacent bicycles to be loaded closer together as the steering mechanisms are turned at right-angles, and do not foul each other. The carrier can be folded to reduce storage or car parking problems. Carrier attachment to vehicle is envisaged as "strap and brackets" to the vehicle superstructure or by attachment to the vehicle tow-hitch. The same concept of carrier can also be incorporated into the design of a trailed vehicle, enabling a significant number of bicycles to be transported within a small volume.

A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:

- FIG 1 Shows the cycle carrier folded and attached to the tow-vehicle.
- FIG 2 Shows the cycle carrier unfolded and ready to have bicycles loaded.
- FIG 3 Shows the cycle carrier with a bicycle attached to it.
- FIG 4 Shows an adaption of the invention incorporated in the design of a trailer, and in a folded configuration.
- FIG 5 Shows the trailer version in an unfolded configuration.
- FIG 6 Shows the trailer version carrying a bicycle.

Referring to Fig 1 a rectangular framework 2 is vertically attached to the vehicle special tow-hitch 1 by a quick release pin. An additional rectangular framework 3 is attached to framework 2 by a pair of hinge mechanisms 5. The hinges 5 permit the frameworks 2 and framework 3 to be folded together, for car parking, or carrier storage. The hinges 5 also permit framework 2 and framework 3 to be positioned approximately at right angles to one another. The upper rail 4 of framework 2 is provisioned with a plurality of bicycle tube clamping arrangements.

Fig 2 shows the carrier with frame 2 unfolded in its carrying mode, made possible by hinges 5. The frame 3 forms an approximate right angle with frame 2 and is held in this position by an end stop on frame 3 contacting frame 2.

Fig 3 shows the bicycle 6 with its front wheel removed, and held in the carrier. The bicycle 6, rear wheel is held tightly as it drops between the framework on framework 3, where the gap is equivalent to a major chord, (but less than the diameter of the bicycle wheel). The bicycle 6 front wheel-forks over-hang the carrier's vertical framework 2 whilst the bicycle 6 lower diagonal frame tube is engaged in the tube clamping arrangement at bar 4. Further security of attachment to the carrier can be provided by strapping the wheel where the tyre comes into contact with the frame 3.

A further example of the invention is described with reference to Fig 4, Fig 5 and Fig 6.

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Fig 4 is a trailer chassis consisting of an axle assembly 7 and a drawbar 8. The vertical frame 2 is attached to the axle assembly 7. A frame 3 can be attached to frame 2 by a hinge mechanism. An additional frame 3 is attached to the other side of frame 2 by an additional hinge mechanism.

Fig 5 shows the trailer with both frames 3 dropped into their cargo carry configurations.

Fig 6 shows the trailer loaded with two bicycles forming a pyramid style configuration.

CLAIMS

- 1 A vehicle mounted bicycle transportation carrier, which supports one or more cycles in a vertically poised configuration, with the bicycle weight being exclusively taken on its rear wheel.
- 2 A cycle transportation carrier as in (1) where the cycle is balanced in its vertical configuration by clamping the cycles lower diagonal frame tube to the carrier.
- 3 A bicycle transportation carrier as in (1) and (2) where the bicycle front wheel is removed and the steering mechanism is rotated through approximately 90 degrees to enable closer stacking of a number of bicycles.
- 4 A bicycle transportation system as in (1) to (3) which is attached to the rear of a vehicle by means of a quick release mechanism to the vehicle tow-hitch.
- 5 A bicycle transportation system as in (1) to (3) which is incorporated into the design of a trailed vehicle chassis.

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- 6 A bicycle transportation system as in (1) to (5) where the carrier consists of a single bicycle wheel support framework which can accommodate one or more bicycles, which is attached by a hinged mechanism to a vertically positioned framework, whose function is to balance the bicycles in an approximate vertical position.
- 7 A bicycle as in (1) to (6) where the bicycle wheel support framework can be folded onto the vertical framework to permit easy vehicle parking, or to enable the carrier to have a compact storage potential.
- 8 A bicycle support means substantially as shown in or as described with reference to the accompanying figures.

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Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

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Relevant Technical Fields

Search Examiner
 COLIN THOMPSON

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(ii) Int Cl (Ed.5) B60R 9/10; B62D 63/06

Date of completion of Search
 1 FEBRUARY 1994

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant following a search in respect of Claims :-
 1-8

(ii)

Categories of documents

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| <p>X: Document indicating lack of novelty or of inventive step.</p> <p>Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p>A: Document indicating technological background and/or state of the art.</p> | <p>P: Document published on or after the declared priority date but before the filing date of the present application.</p> <p>E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.</p> <p>&: Member of the same patent family; corresponding document.</p> |
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Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2225299 A (STEVENSON)	1,4,6,7
X	US 5065921 A (MOBLEY)	1
X	US 4790713 A (MILLER)	1,6
X	US 4171077 A (RICHARD)	1,2
X	US 3921869 A (ROGERS)	1

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).

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